PRINCE EDWARD ISLAND

ENERGY CORPORATION

REPORT

SURVEY OF WOOD FUEL USE IN PRINCE EDWARD ISLAND

1984 - 1985

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SURVEY OF WOOD FUEL USE IN PRINCE EDWARD ISLAND
1984-1985

ABSTRACT*

A one percent telephone survey in March of 1985 of the 37,600[1] Prince Edward Island residential units indicated that the 61% of Prince Edward Island households using wood as a fuel burned 119 thousand cords of wood in the 1983-1984 heating season and anticipated consumption for the 1984-1985 heating season to be also 119 thousand cords. In 1983-1984 and 1984-1985 this represented an average consumption of 5.2 cords per household. Of the fuelwood burned in 1984-85, 100% hardwood and a 75%/25% mix of hardwood/ softwood represented 66% of residential useage. Air tight stoves (46%), wood furnaces (18%) and kitchen wood ranges (14%) dominated the type of equipment used by wood burning residents. Of the non-wood burning households surveyed 20% indicated that consideration was being given to the possibility of heating with wood. In 1984-85 it is calculated that 54 million litres of light fuel oil were displaced by wood for a value of $21 million in displaced oil purchases.

SUMMARY OF FINDINGS*

1. 61% of the 37,600 households in Prince Edward Island burn some wood for space heating purposes.
2. 35% of those households burning wood for space heat also use wood to heat domestic hot water.
3. Of the wood burning residents 58% list an oil furnace or oil boiler as the non-wood heating system of the residence. 21% of the residential units which burn wood use wood burning appliances only for space heat.
4. 46% of the wood users have air tight stoves as the primary appliance burning wood, 18% list wood furnaces as the primary equipment and 14% identified kitchen wood ranges as primary. The use of an oil assist on kitchen ranges, combination oil-wood furnaces, non-air tight stoves, fireplaces and fireplace inserts make up the remaining 22%.

[1] Most recent Stats Canada data.

5. 34% of the wood burned is a mix of 75% hardwood and 25% softwood. 32% is hardwood only. 24% is 50% hardwood and 50% softwood. The remaining 10% is comprised of softwoods only and 75% softwood/25% hardwood.
6. 52% of wood users obtained their wood from user-owned forest land, a friend's woodlot or crown land. The remaining wood users (48%) purchased their wood from commercial vendors, from friends and neighbours or from sawmill waste.
7. 46% of those who used their own wood did so by clear-cutting methods. The other harvesting methods used represented a more selective system of removing fuel from woodlots.
8. Of those wood users who harvested their own material, only 9.2% were involved in a forestry management program. 3% indicated they did not know.
9. Of those involved in a forestry management program, 36% indicated the program was a federal/provincial government program, 55% indicated it was not and 9% did not know.
10. 44% of those using their own woodlots indicated that other wood burners were getting fuel from the owner's woodlot.
11. 83% of those harvesting their own wood expressed confidence in the supply of wood from their woodlots. 45% of those who purchased wood from commercial vendors were confident about continuing availability. More confidence (72%) was expressed by those who purchased from friends and neighbours.
12. Of the wood users who purchased their fuel, 53% bought blocked wood, 21% purchased their wood in 8' lengths and 15% bought their wood blocked and split.
13. The average price for a cord of purchased fuelwood was determined to be $71 from commercial vendors and from friends or neighbours.
14. 57% of those who purchased wood indicated they were unwilling to switch from burning hardwood to burning softwood.
15. 57% of wood burning residential units consumed four or more cords of wood in the 1983-84 heating season. For the 1984-85 heating season it was anticipated that 58% would consume four or more cords.
16. Of the respondents, 71% lived in rural areas of Prince Edward Island, with the remaining 29% residing in the urban areas, particularly the greater Charlottetown and Summerside areas.

17. 20% of the non-wood burners are considering the possibility of heating their homes with wood, 72% are not considering the use of wood, and 8% are uncertain.

18. In a comparative analysis between the survey of 1982-83 and the 1984-85 heating seasons the following data were assembled:
    a) households burning wood experienced little change over the period;
    b) space heating wood stove utilization (air tight and non-air tight) increased from 41% to 51% of the total over the period;
    c) the use of oil assist burners on kitchen ranges dropped by over 15% of the total over the period; and
    d) wood furnace/boiler units use dropped by 9% over the period the two surveys were conducted.

*In the Abstract and Summary all data have been rounded to the nearest full percentage or to two or three significant figures. They may therefore differ slightly from the figures given in the report.

NOTE: In the main body of the report some totals do not add up to 100% because of rounding.

INTRODUCTION

March of 1985 marked the fourth in a series of fuelwood surveys conducted in the province of Prince Edward Island. The surveys in the winter of 1980 and in 1981 were carried out by the Institute of Man and Resources (IMR) operating under the Canada-P.E.I. Agreement on Renewable Energy Development. A further study conducted by Resource Ventures Incorporated (RVI) (a subsidiary of IMR) was conducted for the P.E.I. Energy Corporation in the winter of 1983. The study presented here was also commissioned by the P.E.I. Energy Corporation. Resource Ventures Incorporated conducted the survey.

The findings conclude that residential wood fired space heating has experienced a marginal increase in the past two years with the volume of fuelwood consumption increasing by about 8% when compared to the last study. Such increases may be a result of questionnaire procedures. Some shifts in the types of wood burning appliances have occurred.

This paper will report the data for the winter 1985 survey and suggest trends and variations based on the data of all four fuelwood studies.

It should be noted that the first study in the winter of 1980 surveyed 1% of only owner-occupied households excluding all rental dwellings, C.F.B. Summerside, and senior citizens housing. In subsequent surveys it was deemed desirable to eliminate the bias towards the owner-occupied households: consequently in the 1981, 1983 and 1985 surveys all households were considered eligible to be surveyed.

The primary objectives of this study were to determine:

1. the number of households burning wood for space heating requirements;
2. the primary wood burning appliances utilized by the households;
3. the sources of the fuelwood; and
4. the consumption of fuelwood in the province.

METHODOLOGY

1. Random Sampling: The survey was conducted by telephone interviews with 376 randomly chosen owner-occupied and rental dwellings throughout the province. The household telephone numbers were established by matching four and five digit random numbers generated by computer to a household listed in the current telephone directory. By matching the first two or

three digits of the computer-generated number to numbered columns in the directory, and matching the last two digits to correspond to the position of that household in the column, the telephone number would be identified and the respondent called and interviewed.

The 376 households represent 1% of the total number of owner-occupied and rental dwellings in the province from Statistics Canada information as of June 1981. A pretest of 35 random households was conducted to define the organization, clarity and length of time involved in the survey interview.

2. Survey Bias: As in many surveys, potential biases become apparent. "Bias is the difference between the estimated value of a statistic obtained by random sampling and the true value."[1] The major potential bias in this telephone survey is that the estimated value (for example, the number of cords burned per household) may not reflect the actual value. However wood fired heating has become a major energy alternative for the Prince Edward Island consumer who has an incentive to determine the cost-effectiveness of wood vs. oil fired heating. Consequently, it can be assumed that estimates are close to the actual value. In addition, although some households may over estimate, a number of others will under estimate the true amount.

   Other potential telephone survey biases include those households without telephones and those dwellings with unlisted telephone numbers. Research on the accuracy of telephone surveys of wood fuel use in New England suggest that biases resulting from these factors are small.

RESULTS OF THE 1985 P.E.I. FUELWOOD SURVEY

1. Profile of All Wood Users in Prince Edward Island

The data have shown that 61.4% (231 of a sample of 376) of all households in the province burn some wood for space heating purposes.

Other heating systems of those households using wood are listed in the following table.

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[1] Bailey, Mark and Paul Wheeling, Wood and Energy in Maine, Natural Resources Economics Division, Economic Research Service, U.S. Depart. of Agriculture, 42 pp, 1982.

TABLE 1

Other Heating Systems of the Wood Users
(N = 231)

	Households	% Response
Hot air oil furnace	60	26.9
Wood unit(s) only	48	20.8
Hot water oil boiler	73	31.6
Combination (wood/oil) furnace/boiler	21	9.1
Oil space heater	4	1.7
Kerosene heater	1	0.4
*Kemac	15	6.5
Electric heat	9	3.9
TOTALS	231	100.0

*Kemac is the trade name for a common oil assist unit attached to the back of a wood burning kitchen range. The Kemac and other similar units, such as the Boston Breeze, were commonly used through the 1950's, 60's and 70's in Prince Edward Island. Initially such units were used to assist in the burning of wood, but as oil became more common and cheap, many householders stopped using wood and relied entirely upon oil.

The main wood burning appliances found in the wood user sample are identified in the following table.

TABLE 2

Primary Wood Burning Appliances of the Wood Users
(N = 231)

	Households	% Response
Air tight wood stove	106	45.9
Wood furnace/boiler	41	17.7
Kitchen wood range	32	13.9
Kemac	13	5.6
Combination (wood/oil) furnace/boiler	19	8.2
Non-air tight wood stove	12	5.2
Open fireplace	5	2.2
Fireplace insert	3	1.3
TOTALS	231	100.0

Among the wood users, 35.1% heated all or some of their domestic hot water by burning wood.

An analysis of the duration of wood burning by respondents showed that 12.6% of households began burning wood in just the last two years. The duration of all wood burning respondents is found in the following table.

TABLE 3

Duration of Wood Heat Use
(N = 231)

	Households	% Response
0 - 2 years	29	12.6
2 - 4 years	56	24.2
4 - 6 years	52	22.5
6 or more years	94	40.7
TOTALS	231	100.0

The following table indicates various wood types used to fuel the wood burning appliances.

TABLE 4

Wood Types Used in Space Heating
(N = 231)

	Households	% Response
Softwoods only	7	3.0
Hardwoods only	75	32.5
Sawmill wastes	0	0.0
75% hardwood/25% softwood	78	33.8
50% hardwood/50% softwood	55	23.8
75% softwood/25% hardwood	16	6.9
Wood pellets	0	0.0
TOTALS	231	100.0

Of the wood users, 73.6% reported burning seasoned wood; 22.5% burned a mixture of seasoned and green wood; 3.9% admitted to burning primarily green wood.

A question about the sources of fuelwood elicited the information that 52.4% of the wood users got their wood from a personal woodlot, a friend's woodlot or from crown land, while 47.6% purchased their fuel from commercial sources or from neighbours/friends with a woodlot. The breakdown of wood source is given in the following table.

TABLE 5

The Sources of Fuelwood
(N = 231)

	Households	% Response
Harvested from:		
User owned woodlot	92	39.8
Friend's or neighbour's woodlot	27	11.7
Crown lands	2	0.9
Purchased from:		
Sawmills	2	0.9
Commercial vendors	61	26.4
Neighbours and/or friends	47	20.3
TOTALS	231	100.0

It will be noted that there has been a significant shift in the data for those who get their wood from woodlots (owner, friends/neighbours or crown land). 68.8% in 1982-83 to 52.4% in 1984-85.

2. Profile of the Fuelwood Harvesters

Fuelwood harvesters in the survey included those who took wood from private woodlots, crown lands and from woodlots of friends/neighbours.

Various harvesting methods were used as shown in the following table.

TABLE 6

Harvesting Methods
(N = 120)

Method	Households	% Response
Clear-cutting all trees	55	45.8
Removing dead trees	23	19.2
Thinning Poor Stock	12	10.0

TABLE 6 (continued)

Method	Households	% Response
Picking and choosing trees	15	12.5
Don't know	15	12.5
TOTALS	120	100.0

The survey identified various methods self-harvesters used in transporting fuelwood from woodlot to the household. The following table indicates the breakdown of transportation systems.

TABLE 7

Transporting Fuelwood from Stump to Household
(N = 120)

Method	Households	% Response
Tractor and trailer	65	54.1
Horse	3	2.5
Snowmobile	1	0.8
Skidder (porter-forwarded)	0	0.0
Manual/truck	44	36.6
Yard-arm	0	0.0
Tractor and winch	7	5.8
TOTALS	120	100.0

The study has revealed that 9.2% of those who harvested their own supply of wood were involved in a forestry management program. Of that number 36.4% indicated the management program was a federal/provincial program, 54.5% some other program and 9% did not know what kind of program it was. 87.5% of the harvesting sample reported they were not involved in a woodlot management program and 3.3% of the respondents did not know.

Of those who harvested from their own woodlots, 44.2% indicated that one to four other wood burning householders used the owners woodlot to obtain fuel. 55.8% of woodlot owners who harvested from their own woodlot did not have others use the resource.

The most popular season for harvesting fuelwood was shown to be the period between October and December. Table 8 provides details on times of harvest.

TABLE 8

The Season for Harvesting Fuelwood

(N = 120)

	Households	% Response
January - March	18	15.0
April - June	20	16.7
July - September	24	20.0
October - December	58	48.3
TOTALS	120	100.0

Of the harvesters, 83% were confident about their supply of wood in their woodlots; 11% reported a lack of confidence in supply; and 6% were uncertain about their fuelwood supply.

3. Profile of the Fuelwood Purchasers

The purchasers consisted of householders who buy fuelwood from commercial vendors or from neighbours/friends who sell from their own woodlots.

In the sample of wood purchasers, 68.5% stated the correct dimensions of a full cord of wood as 128 cu. ft. or 4'x4'x8'. The remainder, 31.5% either were not sure or didn't know the exact dimensions of a full cord. This represents a significant drop from the figure of 94.2% who knew, obtained in the 1982-83 survey.

The purchasers showed various preferences in the size and dimension of fuelwood they bought as is reported in the following table.

TABLE 9

Characteristics of Fuelwood at Time of Purchase

(N = 111)

	Households	% Response
8' lengths	23	20.7
4' lengths	1	0.9
Blocked	59	53.1
Split wood	17	15.3
Slabs - blocked	1	0.9
Softwood slabs	1	0.9
Chips/sawdust	0	0.0

TABLE 9 (continued)

	Households	% Response
Wood pellets	0	0.0
Tree length	9	8.1
TOTALS	111	100.0

The average price of a purchased cord of fuelwood was determined to be $71.00 for those who buy wood from commercial sources. This price reflects the average price of all types of fuelwood and the variation ranged from $30 to $120 per cord depending on the characteristics of the fuelwood. (NOTE: 75.6% of respondents who purchased their wood indicated the price paid included delivery of the wood; 19.8% said delivery was not included; and 4.5% did not know.)

When asked about switching to burn softwood as a major source of fuel, 27% of the purchasers reported they didn't know what they would be willing to pay for a cord of softwood, while 56.7% stated they would not switch to softwood. The remainder, 17.1%, indicated they would be willing to pay between $20 and $70 a cord for softwood with the largest group (7.2%) at the $20-30 range.

Like those who harvest their own fuelwood, most purchasers (53.1%) identified October to December as the preferred time for assembling their fuel.

TABLE 10

The Season for Purchasing Fuelwood

(N = 111)

	Households	% Response
January - March	3	2.7
April - June	15	13.5
July - September	34	30.6
October - December	59	53.1
TOTALS	111	100.0

The majority of purchasers felt that fuelwood in their area was readily obtainable. 45% of the commercial buyers were confident about availability

while 72% of those who purchase from friends/neighbours felt confident about the supply. In the sample of those who purchased wood from friends/ neighbours, 11% stated problems in availability in their area and 24% were uncertain about steady supplies of fuelwood from dealers. 24% overall indicated they did not know about availability of supply. As in the case of woodlot users, the level of confidence has significantly decreased when compared to the last survey.

4. Profile of Fuelwood Consumption in P.E.I. (Heating Seasons of 1983-1984 and 1984-1985)

4.1 Average and Total Consumption in the Province

For the heating season of 1983-1984, Prince Edward Island wood burning households consumed an average of 5.18 cords of fuelwood amounting to a total provincial consumption of about 119,400 cords. Details of 1983-1984 consumption are outlined in Table 11.

TABLE 11

Fuelwood Consumption for Wood Burning Households in P.E.I., 1983-1984 (N = 231)

Cords Burned	Households	% Response
Don't know	32	13.9
1 - 2	22	9.5
2 - 3	23	10.0
3 - 4	22	9.5
4 - 5	26	11.3
5 - 6	39	16.9
6 - 7	11	4.8
7 - 8	17	7.4
8 or more	39	16.9
TOTALS	231	100.0

The projected average consumption of fuelwood for 1984-85 was established at 5.18 cords with a total consumption of about 119,400 cords. These data are based on estimated consumption provided by the wood burning householders.

TABLE 12

Fuelwood Consumption for Wood Burning Households in P.E.I., 1984-1985 (N = 231)

Cords Burned	Households	% Response
Don't know	30	13.0
1 - 2	24	10.4
2 - 3	18	7.8
3 - 4	25	10.8
4 - 5	27	11.7
5 - 6	47	20.3
7 - 8	16	6.5
8 or more	44	19.0
TOTALS	231	100.0

4.2 Profile of Respondents

34.0% of all respondents came from Prince County, 50.7% from Queens County and 15.3% from Kings. 71.3% indicated they came from a rural area and 28.7% from an urban area. Of those from an urban area 71.3% indicated Charlottetown and 28.7% Summerside as their place of residence.

5. Profile of Non-Wood Users in Prince Edward Island

Hot water oil-fired boilers, followed by forced air oil-fired furnaces, were the most prevalent heating systems in the non-wood user sample. Table 13 itemizes the primary systems used by non-wood users.

TABLE 13

Primary Heating Systems of the Non-Wood Users, P.E.I., 1984-1985 (N = 145)

Heating Systems	Households	% Response
Forced air oil furnaces	67	46.2
Hot water oil boiler	68	46.9
Electric heat	6	4.1
Oil space heater	2	1.4
Propane heat	2	1.4
TOTALS	145	100.0

Among those not using wood, 18.6% indicated they had used wood in the past 15 years. 80.0% had not and 1.4% did not know.

Among those householders not using wood, 20% have considered the possibility of heating their homes with wood. 72.4% stated they were not considering it, and 7.6% were uncertain about this alternative.

Of the non-wood users, 47.6% felt that those heating with wood were saving energy dollars as compared to those heating only with oil-fired systems. A lower number, 15.2%, stated they could see no savings and the remainder, 37.2%, stated they didn't know whether wood heating was more economical than oil-fired space heating.

6. Comparative Data From Four Fuelwood Surveys

6.1 Wood Burning Households

Table 14 outlines the percentage of P.E.I. households burning wood in the 1979-80, 1980-81, 1982-83 and 1984-85 heating seasons.

TABLE 14

Households Burning Wood in Prince Edward Island Between 1979 and 1985

	1979-1980 Survey	1980-1981 Survey	1982-1983 Survey	1984-1985 Survey
% Response	54.4%	62.0%	60.4%	61.4%

The 1979-80 survey omitted all rental households, C.F.B. Summerside, and senior citizens housing from the sample; consequently, the data indicated 70.6% of the owner occupied dwellings used wood, many of them for aesthetic reasons. The adjusted value of 54.4% for 1979-80 is proportionate to the total number of all P.E.I. households and corresponds to the 1980-81, 1982-83 and 1984-85 data.

6.2 Primary Wood Burning Appliances

Table 15 outlines the primary wood burning appliance as determined in the four separate surveys.

TABLE 15

Comparison of Wood Burning Appliances in Wood User Households in Prince Edward Island, 1979-1980 to 1984-1985

Wood Burning Appliance	1979-1980 Survey	1980-1981 Survey	1982-1983 Survey	1984-1985 Survey
Air tight stove	*	20.0%	37.4%	45.9%
Wood furnace/boiler	9.0%	9.0%	26.9%	17.7%
Kitchen wood range	17.6%	10.0%	18.5%	13.9%
Kemac	27.0%	25.0%	6.6%	5.6%
Combination furnace	10.3%	7.0%	4.9%	5.2%
Non-air tight stove	*	19.0%	3.6%	5.2%
Open fireplace/ fireplace insert	7.7%**	3.0%	2.1%	3.5%

*In the 1979-1980 survey, air tights and non-air tights were grouped together so that the true value for air tights is unknown.

**In 1979-1980, 7.7% of the households reported open fireplaces used more for aesthetic purposes than for supplemental space heating.

6.3 Wood Fired Domestic Hot Water

TABLE 16

Households Using Wood Fired Domestic Hot Water Among Wood User Households in P.E.I., 1979-1980 to 1984-1985

1979-1980 Survey	1980-1981 Survey	1982-1983 Survey	1984-1985 Survey
31.0%	24.0%	39.7%	35.1%

6.4 Acquisition of Fuelwood

Table 17 demonstrates a very recent growth in the proportion of householders who purchase their wood fuel compared to those who cut their own supply.

TABLE 17

Sources of Fuelwood Among Wood User Households in P.E.I., 1979-1980 to 1984-1985

	1979-1980 Survey	1980-1981 Survey	1982-1983 Survey	1984-1985 Survey
Harvested fuelwood	69.1%	67.0%	68.2%	52.4%
Purchased fuelwood	30.9%	32.0%	31.8%	47.6%

6.5 Cutting Patterns of Wood Fuel Harvesters

Table 18 indicates a degree of management of the woodlot. Clear cutting would appear to be decreasing while removing dead trees has increased.

TABLE 18

Methods of Harvesting Wood Fuel Among Harvesters in Prince Edward Island, 1979-1980 to 1984-1985

	1979-1980 Survey	1980-1981 Survey	1982-1983 Survey	1984-1985 Survey
Clear cutting all trees	51.3%	84.0%	60.9%	45.8%
Removing dead trees	36.7%	7.0%	7.7%	19.2%
Thinning poor stock	3.3%	8.0%	19.2%	10.0%
Selecting fuel wood trees	8.7%	1.0%	12.2%	12.5%
Don't know	---	---	---	12.5%

6.6 Characteristics of Purchased Fuelwood

Table 19 suggests that most purchased fuelwood identified in the four surveys was in the form of 8' lengths and blocked roundwood.

TABLE 19

Types of Purchased Fuelwood Among Wood Fuel Purchasers in Prince Edward Island, 1979-1980 to 1984-1985

	1979-1980 Survey	1980-1981 Survey	1982-1983 Survey	1984-1985 Survey
8' lengths	17.9%	24.0%	28.2%	20.7%
Blocked	68.7%	40.0%	52.1%	53.1%
Split wood	13.4%	36.0%	11.3%	15.3%
Chips/sawdust	---	---	2.8%	0.0%
4' lengths	---	---	1.4%	0.9%
Pellets	---	---	1.4%	0.0%
Slabs	---	---	2.8%	1.8%
Tree lengths standing	---	---	---	8.1%

6.7 Average Price of Purchased Fuelwood

In 1979-1980 the average price of a cord of wood was $50.00 and in 1980-1981 increased to $54.00. These prices reflect hardwood purchased both from commercial wood fuel dealers and from neighbours/friends. In 1982-1983 the average price of a cord of hardwood was $71.45 if purchased from

commercial sources and $63.70 when purchased from neighbours/friends. The increase from 1979-1980 to 1980-1981 was 7.4%. There was up to a 25% increase in price between 1980-1981 and 1982-1983 with the upper limit representing commercially purchased wood. The data for the 1984-1985 survey suggests an average price of $71.00 per cord for all purchased wood.

6.8 The Average and Total Consumption of Fuelwood

Table 20 outlines the average consumption of fuelwood and total volume in cords for the Province of Prince Edward Island as found in the four surveys.

TABLE 20

The Average Household and Total Consumption of Fuelwood in the Province of Prince Edward Island, 1979-1980 to 1984-1985

	1979-80*	1980-81*	1981-82	1982-83	1983-84	1984-85 (Projected)
Average consumption (cords)	3.60	3.90	4.64	4.89	5.18	5.18
Total volume (cords)	72,000	79,000	104,678	110,318	119,400	119,400

*NOTE: Values for 1979-1980 and 1980-1981 have been rounded.

CONCLUSIONS

95% Confidence Limit

The 1984-85 survey has indicated that 61.4% of all households in Prince Edward Island burn wood for space heating. A statistically accurate picture of the prevalence of wood heating can be deduced from calculating the standard error (sp) and the 95% confidence limits[1].

$sp = (p.q/n)^{\frac{1}{2}}$ where sp = standard error
p = percentage of households using wood
q = percentage of households not using wood
n = sample size

$\therefore sp = [(61.4 \times 38.6)/376]^{\frac{1}{2}} = 2.51$

[1] Harper W. Boyd, Jr. and Ralph Westfall, Marketing Research Text and Cases, Richard D. Irwin Inc., Homewood, Ill.: 1972.

The 95% confidence limits would then be:

$p \pm 2(sp)$

or $60.4 \pm 2(2.51)$

$= 60.4 \pm 5.02$

= 55.4% to 65.4%

The actual percentage of households using wood fuel has a 95% chance of lying within this range.

Available Heat (1984-1985)

Available heat is calculated by multiplying the estimated volume of wood by the estimated efficiency of wood burning equipment, and the heat content per cord. Assuming a burning efficiency of 50% and an estimated 119,400 cords of wood consumed in 1984-1985, available heat can be calculated as follows:

Available heat = 119,400 cords x 0.50 x 23 million Btu/cord

$= 1.37 \times 10^{12}$ Btu

or nearly 1.4 trillion Btu's of potential heat energy

Light Fuel Oil Displacement

To calculate the potential volume of LFO (light fuel oil) displaced by wood, 100 gallons (455 litres) of LFO can be conservatively substituted for 1 cord of average fuelwood.

$\therefore$ 119,400 = 11,940,000 gallons (54,300,000 litres) of LFO

at = \$1.77/gallon (38.9¢/L): $11.94 \times 10^6 \times \$1.77 = \$21 \times 10^6$

or \$21 million in displaced oil purchases

DISCUSSION

In the 1982-83 Wood Fuel Survey attention was drawn to the significantly high proportion of hardwoods used by Prince Edward Island residents in their fuel mix. It was suggested that there was a need for serious evaluation of the impact such utilization would have upon P.E.I. woodlots and their sustainability.

The results of this years survey do suggest a significant shift from hardwoods to softwoods; however, the preponderance of usage remains with hardwoods only, at 32.5% and a mixture of hardwoods (75%) and softwoods (25%) at 33.8% for a total of 66.3%. This compares to 79.8% in 1982-1983.

When this shift of wood type being burned is taken into consideration in the context of the confidence wood burners have in their supply of fuel, one of the reasons for some switching to softwoods is perhaps understood. In 1982-83, the level of confidence of supply was extremely high. Among those harvesting their own supply, 94.2% were confident, compared in 1984-85 to 83.3%. Among those who purchase their supply, 87% were confident of supply in 1982-83, but in 1984-85 this had dropped to 58.5%. It may well be that some wood users have less choice in determining the kind of wood utilized.

In the 1984-85 survey 56.7% of those who purchase their wood indicated they would not switch to burning softwood. This is up considerably over the figure of 36.6% in the 1982-83 survey. There would, therefore, appear to be a growing resistance on the part of wood buyers to the use of softwoods.

Reference was made in the 1982-83 survey to the potential problems of high utilization of hardwoods in the traditional form of roundwood and burned in conventional wood burning appliances. This year's survey would strongly suggest that this problem is still with us. It will be useful to repeat the comments made in the 1982-83 report.

> "An alternative to the current predominant method of harvesting wood fuel is that of a "biomass" harvest which has the potential of recovering twice as much of the available resource as compared to conventional harvesting techniques. Using this method of harvesting, the form of the fuel can be chips or wood pellets and under these circumstances it is relatively immaterial if softwood or hardwood species are utilized.
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> Thus in turning to more "biomass" harvesting the availability of the resource may be doubled and an appropriate mix of softwoods and hardwoods can be better realized. The P.E.I. Forestry Division is encouraging this approach. To be effective, markets for the product must be developed. In some applications improved combustion technology will also be needed.
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> Combustion Equipment
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> If a more aggressive approach to "biomass" harvesting is to be successful a major conversion of wood burning equipment is required. The present high reliance (82.8%) upon conventional air tight stoves, roundwood burning furnaces/boilers and kitchen ranges would have to be overcome before the benefits of "biomass" harvesting could be fully realized."

Woodlot Management

The 1984-85 survey would suggest that there are more woodlot owners involved in a management program. 9.2% indicated that they were operating under a management program but of that number only 36.4% identified that program as being the federal/provincial government program. In 1982-83 only 3.8% indicated participation in a woodlot management program. It would, therefore, appear that there is still considerable room for aggressive promotion of the advisability and usefulness for woodlot owners to become involved in woodlot management.